

**Linear Functions**

<p>1. Convert the following to slope intercept form.</p> $4x + 10y = 20$ $\begin{array}{r} -4x \quad -4x \\ \hline 10y = \frac{20 - 4x}{10} \end{array}$ $y = 2 - \frac{2}{5}x$	<p>2. Find the equation of the line that passes through the points <math>(-4, 9)</math> and <math>(5, -12)</math>.</p> <p>Slope:</p> $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-12 - 9}{5 - (-4)}$ <p style="text-align: center;">↑ be careful!</p> $m = \frac{-21}{9}$ $y - 9 = \frac{-21}{9}(x + 4)$
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3. Describe what it means to be a "solution" to an equation or a system. How can you check that a value or an ordered pair is a solution?

A solution makes the equation(s) true. You can check if a value is a solution by plugging it in to the equation(s).

**4. Solve the system by substitution.**

$$x = 3y + 8$$

$$5x + 2y = 6$$

$$5(3y + 8) + 2y = 6$$

$$15x + 40 + 2y = 6$$

$$17y + 40 = 6$$

$$17y = -34$$

$$y = -2$$

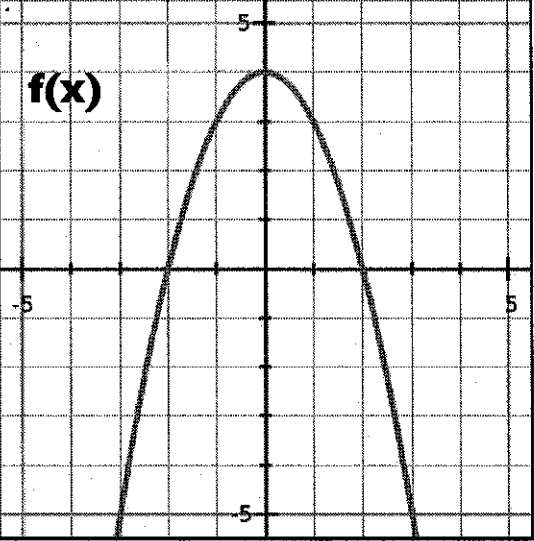
don't forget x...

$$x = 3(-2) + 8$$

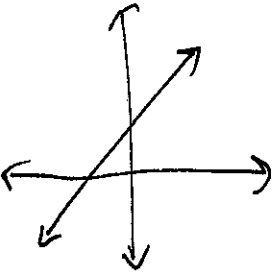
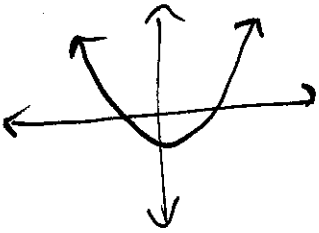
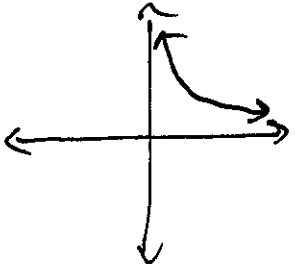
$$x = 2$$

$$(2, -2)$$

5. Use the graph of  $f(x)$  and the equation  $g(x)$  find the following values.

	$g(x) = 4x^2 - 6$
$f(2) = 0$	$g(2) = 10$
$f(-1) = 3$	$g(-1) = -2$

6. Draw a sketch of each type of function. Identify a general form equation for each.

Linear	Quadratic	Exponential
<p>Sketch:</p> 	 <p>Parabola!</p>	
<p>Equation:</p> $y = mx + b$	$ax^2 + bx + c = y$	$a \cdot b^x = y$

**Simplify the following using exponent rules.**

<p>7. <math>(a^2b^{13}c^2)(a^5b^9)</math></p> $a^7b^{22}c^2$ <p>Add exp!</p>	<p>8. <math>((x^4)^2)^3</math></p> $x^{24}$ <p>multiply exp!</p>	<p>9. <math>\frac{y^3x^5}{yx^2}</math></p> $y^2x^3$ <p>subtract exp!</p>	<p>10. <math>\frac{1}{2y \cdot x^{-4}}</math></p> $\frac{1 \cdot x^4}{2y}$ <p>move &amp; make positive</p>
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**Solve the following inequalities. (What do you do if you divide or multiply by a negative while solving?)**

<p>11. <math>2 - 5x &gt; 13</math></p> $x < \frac{11}{-5}$	<p>12. <math>-15c - 28 &gt; 152</math></p> $c < -12$	<p>13. <math>2x - 3 &gt; 2(x-5)</math></p> $\begin{array}{r} 2x - 3 > 2x - 10 \\ -2x \quad -2x \\ \hline -3 > -10 \end{array}$ <p>No solution!</p>
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**Simplify the following radicals**

<p>14. <math>\sqrt{162}</math></p> $\sqrt{2 \cdot 81}$ $9\sqrt{2}$	<p>15. <math>\sqrt{121x^{14}y^6}</math></p> $11x^7y^3$	<p>16. <math>-\sqrt{81m^{64}}</math></p> $-9m^{32}$	<p>17. <math>-\sqrt{4a} + 9\sqrt{16a} - 3\sqrt{36a}</math></p> $-2\sqrt{a} + 36\sqrt{a} - 18\sqrt{a}$ $16\sqrt{a}$
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18. Solve the following quadratic three ways.

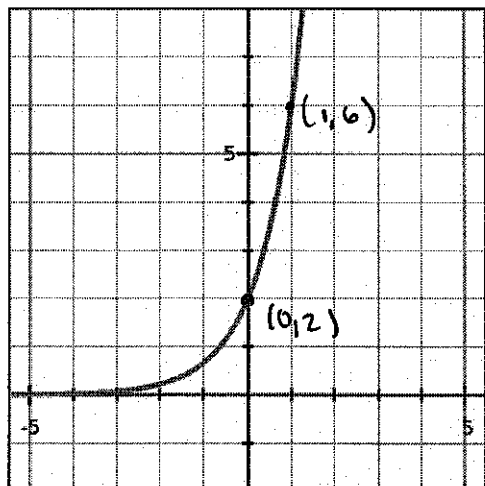
$$3x^2 - 5x - 18 = 2x^2 - 2x$$

First set = 0 !!!

Factoring	Complete the Square	Quadratic Formula
$x^2 - 3x - 18 = 0$ $(x-6)(x+3) = 0$ $x=6 \quad x=-3$	$x^2 - 3x - 18 = 0$ $2x-3 \quad 4x^2 - 12x - 72 = 0$ $+81 +81$ $3 \begin{array}{ c c } \hline 4x^2 & -6x \\ \hline -6x & 9 \\ \hline \end{array}$ $4x^2 - 12x + 9 = 81$ $(2x-3)^2 = 81$ $2x-3=9 \quad 2x-3=-9$ $2x=12 \quad 2x=-6$ $x=6 \quad x=-3$	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $x = \frac{3 \pm \sqrt{(-3)^2 - 4 \cdot 1 \cdot (-18)}}{2 \cdot 1}$ $x = \frac{3 \pm \sqrt{9 + 72}}{2}$ $x = \frac{3 \pm \sqrt{81}}{2}$ $x = \frac{3 \pm 9}{2}$ $x = \frac{12}{2} \quad x = \frac{-6}{2}$ $x=6 \quad x=-3$

## Exponential functions

Write an equation for the following exponential function.



y-intercept: 2  
next point is (1, 6)

$$y = 2 \cdot 3^x$$